Amendments to the Drawings:

The attached sheets of drawings include changes to Figure 2 and new Figs. 2B and 2C. These sheets replace the original sheets.

Remarks/Arguments:

Claims 1 and 13 have been amended. No new matter is introduced herein. Claims 2 and 12 have been cancelled. Of pending claims 1, 3-11 and 13, claims 7-11 are withdrawn.

Claim 1 has been amended to include the features of claims 2 and 12. In particular, claim 1 has been amended to include: 1) a heat dissipating layer bonded to a second surface of the supporting substrate and 2) a through-hole including an electric conductor in the substrate. Claim 1 has also been amended to clarify that the electric conductor, the metal layer and the heat dissipating layer are electrically connected. Claims 2 and 12 have been cancelled. No new matter is introduced herein. Basis for the amendment to claim 1 can be found, for example, at page 5, line 17-page 6, line 7 and Fig. 2A of the subject specification.

Claim 13 has been amended to correct a typographical error and to clarify that the striped pattern or the meshed pattern extends at an angle away from perpendicular relative to an extension direction of the comb-shaped electrode. No new matter is introduced herein. Basis for the amendment to claim 13 can been found, for example, at page 6, line 20-page 7, line 5 of the subject specification.

The drawings have been objected to. In particular, it is asserted that the claimed feature of the first metal layer "having a striped or meshed pattern" is not shown in Figs. 3A-3C. Accordingly, Figs. 2B and 2C have been added. Fig. 2 has been amended as Fig. 2A. No new matter is introduced herein. Figs. 2B and 2C are perspective views of metal pattern 14 having meshed pattern 14b or striped pattern 14a relative to comb-shaped electrode 12. Basis for the amendment can be found, for example, at page 6, line 20-page 7, line 5 of the subject specification. In addition, the subject specification has been amended to correspond to Figs. 2A, 2B and 2C. No new matter is introduced herein. Accordingly, Applicants respectfully request that the objection to the drawings be withdrawn.

Claims 1 and 5 have been rejected under 35 U.S.C. §102(b) as being anticipated by Asai et al. (U.S. 4,449,107). Claim 6 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Asai et al. Claims 2 and 3 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Asai et al. in view of Nakatani et al. (U.S. 6,798,121). Claim 4 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Asai et al. in view of Onishi et al. (U.S. 6,426,583). Claim 12 has been rejected under 35 U.S.C. §103(a) as being

unpatentable over Asai et al. in view of Nakatani et al. and in view of Lee et al. (U.S. 2004/0146409). The features of claims 2 and 12 have been included in claim 1 and claims 2 and 12 have been cancelled. It is respectfully submitted, however, that the remaining claims are patentable over the cited art for the reasons set forth below.

Claim 1, as amended, includes features neither disclosed nor suggested by the cited art, namely:

> a supporting substrate having a first surface bonded to a second principal face of the piezoelectric substrate and a second surface opposite the first surface ...
>
> a heat dissipating layer bonded to the second surface of the supporting substrate,
>
> the supporting substrate includes a through-hole and an electric conductor provided inside the through-hole, and the electric conductor is electrically coupled to the metal layer ...
>
> the electric conductor, the metal layer and the heat dissipating layer are electrically connected. (Emphasis Added)

Asai et al. disclose, in Figs. 5 and 16, a surface elastic wave (SEW) element including (110)-oriented silicon substrate 14 (or (100)-oriented silicon substrate 4A), metallic layer 15 and zinc oxide layer 13 (column 5, lines 50-61 and column 7, lines 47-55). Asai et al. disclose that when the SEW element includes metallic layer 15, an electromechanical coupling coefficient can be selected to reduce an attenuation of the surface elastic wave caused by an electric sound effect (column 8, lines 25-36).

As acknowledged by the Examiner on page 6, paragraph 18 of the Office Action, Asai et al. do not disclose or suggest a heat dissipating layer bonded to a second surface of the supporting substrate, as required by claim 1. Furthermore, as acknowledged by the Examiner on page 5, paragraph 13 of the Office Action, Asai et al. do not disclose or suggest that the supporting substrate includes a through-hole and an electric conductor provided inside the through-hole, as required by claim 1. Accordingly, Asai et al. can not teach that the electric conductor is electrically coupled to the metal layer and that the electric conductor, the metal layer and the heat dissipating layer are electrically connected, as required by claim 1. Thus, Asai et al. do not include all of the features of claim 1.

Nakatani et al. discloses, in Fig. 7, a surface acoustic wave (SAW) device 601 formed from a single piezoelectric substrate 602 and having electrodes 604. Holes 611 are formed through circuit board 607 such that an electrical connection can be made with an external circuit from electrode 604 via hole 611 (column 3, lines 29-41).

As acknowledged by the Examiner on page 6, paragraph 18 of the Office Action, Nakatani et al. do not disclose or suggest a heat dissipating layer bonded to a second surface of the supporting substrate, as required by claim 1.

In addition, Nakatani et al. do not disclose or suggest that the supporting substrate (which is bonded to a piezoelectric substrate) includes a through-hole and an electric conductor provided inside the through-hole, where the electric conductor is electrically coupled to the metal layer, as required by claim 1. On page 7, paragraph 21 of the Office Action, the Examiner asserts that Nakatani et al. is not relied on to teach a metal layer between the piezoelectric substrate and a supporting substrate but that Nakatani et al. is used to teach a through-hole and electric conductor provided inside the through-hole. Applicants respectfully disagree. Although Nakatani et al. teach a hole for electrical connection, Nakatani et al. do not disclose or suggest a through-hole formed within a supporting substrate that has a surface bonded to a piezoelectric substrate. Nakatani et al. only teach that holes 611 are formed through a circuit board 607 that is separate from a surface acoustic wave device 601 (Col. 3, lines 29-41 and Fig. 7). Accordingly, there is no suggestion in either Asai et al. or Nakatani et al. to include a through-hole in a supporting substrate that is bonded to a piezoelectric substrate (where the supporting substrate is part of a surface acoustic wave device), as required by claim 1. In addition, Nakatani et al. cannot teach that an electric conductor, a metal layer and a heat dissipating layer are electrically connected, as required by claim 1. Accordingly, Nakatani et al. do not make up for the deficiencies of Asai et al. with respect to claim 1.

Lee et al. disclose, in Figs. 4B and 4C, a micro-pump including pumping chamber 112, substrate 110 and heat dissipation layer 170 formed above passivation layer 160. As shown in Fig. 4C, heat dissipation layer 170 is connected to substrate 110 through a contact hole C_2. (Paragraphs [0045] and [0053-0054]). Heat dissipation layer 170 is used to dissipate heat from heating element 130 or "other elements near the heating element 130 to the substrate 110 or to the outside." (Paragraph [0054]).

Lee et al., however, do not disclose or suggest that 1) a heat dissipating layer is bonded to a supporting substrate, 2) the supporting substrate includes a through-hole and an electric conductor provided inside the through-hole and 3) the electric conductor, the metal layer and the heat dissipating layer are electrically connected, as required by claim 1. Instead, heat dissipating layer 170 is electrically isolated from any metal layer via passivation layers 140, 160 and insulation layer 120 (Paragraph [0054] and Fig. 4C). Thus, Lee et al. do not make up for the deficiencies of Asai et al. and Nakatani et al with respect to claim 1.

Onishi et al. disclose, in Figs. 13A and 13B, a surface acoustic wave element including first substrate 401, second substrate 402, comb-shaped electrode 403 and reflector 404. (Column 1, lines 35-56). Onishi et al. however, do not disclose or suggest 1) a heat dissipating layer bonded to the supporting substrate, 2) a through-hole in the supporting substrate and an electric conductor inside the through-hole and 3) that the electric conductor, a metal layer (for bonding a piezoelectric substrate to the supporting substrate) and the heat dissipating layer are electrically connected, as required by claim 1. Thus, Onishi et al. do not make up for the deficiencies of Asai et al., Nakatani et al. and Lee et al. Accordingly, allowance of claim 1 is respectfully requested.

Claims 3-6 include all of the features of claim 1 from which they depend and are also patentable over the cited art for at least the same reasons as claim 1.

Claim 13 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Asai et al. in view of Kim et al. (U.S. 2004/0232843). It is respectfully submitted, however, that claim 13 is patentable over the cited art for the reasons set forth below.

Claim 13, as amended, includes features neither disclosed nor suggested by the cited art, namely:

> ... the piezoelectric substrate is bonded to the supporting substrate via a first metal layer, which is formed on the second principal face of the piezoelectric substrate, having a striped pattern or a meshed pattern and a second metal layer formed on the supporting substrate ...
>
> ... the striped pattern or the meshed pattern extending at an angle away from perpendicular relative to an extension direction of the comb-shaped electrode. (Emphasis Added)

Asai et al. are discussed above. As acknowledged by the Examiner on page 6, paragraph 13 of the Office Action, Asai et al. do not disclose or suggest that the first metal layer has a striped pattern or a meshed pattern and a second metal layer formed on a supporting substrate, as required by claim 13. Accordingly, Asai et al. cannot teach that the striped pattern or meshed pattern extends at an angle away from perpendicular relative to a extension direction of a comb-shaped electrode, as required by claim 13. Thus, Asai et al. do not include all of the features of claim 13.

Kim et al. disclose, in Figs. 4 and 5, an AC plasma display panel (PDP) including transparent substrate 120, sustaining electrodes 121 and bus electrodes 122 formed on sustaining electrodes 121. Sustaining electrodes 121 are formed in stripes such that they cross address electrodes 111 (Fig. 4) at right angles. (Paragraph [0054]). Kim et al., however, do not disclose or suggest that a metal layer includes a stripped pattern or meshed pattern where the stripped pattern or meshed pattern extends at an angle away from perpendicular relative to an extension direction of a comb-shaped electrode, as required by claim 13 (emphasis added). Instead, Kim et al. teach that the sustaining electrodes 121 are formed at right angles relative to address electrodes 111. Thus, Kim et al. do not makeup for the deficiencies of Asai et al. Accordingly, allowance of claim 13 is respectfully requested.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,

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Attachments: Figures 2A, 2B and 2C (2 sheets)

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